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GRC Environmental Programs Manual—Chapter 17

Underground Storage Tanks (UGT's)

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Change Record

Revision	Effective Date	Expiration Date	C-25, Change Request #	Description
A	4/2015	4/2020	14-001	Added 6.10 UST Alarms verbiage in order to close out CPAR Updated all form links to reflect the NASA Electronic Form portal. Corrected several form names.

***Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

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NOTE: *This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was March 2015. The current version is maintained on the Glenn Research Center internet at http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

This chapter sets forth Glenn Research Center (GRC) policies and requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting for underground petroleum storage tanks.

2.0 APPLICABILITY

This chapter is applicable to all GRC personnel affiliated with the underground petroleum storage tanks at GRC and to any NASA-controlled, Government-owned facilities associated with GRC. This includes, but is not limited to, fuel delivery personnel, fuel users, general tank maintenance personnel, and regulatory inspectors. Underground storage tanks (USTs) are those with 10 percent or more of their volume underground, including pipes (see Appendix **A**).

3.0 BACKGROUND

Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. The greatest potential hazard from a leaking UST is that its contents (petroleum or other hazardous substances) can seep into the soil and contaminate groundwater, the source of drinking water for nearly half of all Americans. Subtitle I was added to the Resource Conservation and Recovery Act (RCRA) through the Hazardous and Solid Waste Amendments. This created a Federal program to regulate USTs containing petroleum and hazardous chemicals to limit corrosion and structural defects and thus minimizing future tank leaks.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to USTs. The complete regulatory texts should be consulted for further details. The following are the authorities that presently regulate USTs at GRC and are incorporated here by reference:

1. Bureau of Underground Storage Tank Regulations (BUSTR) Ohio Administrative Code (OAC) Chapter 1301:7–9 Underground Storage Tanks and OAC Chapter 1301:7–7–28 Flammable and Combustible Liquids
    a. Ohio codes relevant to USTs
2. National Fire Protection Association (NFPA) Codes 30, 30A, and 47
    a. Code requirements for flammable and combustible liquids, motor fuel dispensing facilities and repair garages, and standard for aircraft fuel servicing
3. Occupational Safety and Health Administration (OSHA), Hazard Communication Standard 29 Code of Federal Regulations (CFR) 1910.1200
    a. Mandates that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. Employees also need to know what protective measures are available to prevent adverse effects.
    b. Applicable to any chemical that could constitute a health or physical hazard to employees in the workplace.
4. Resource Conservation and Recovery Act, Subtitle I, Subchapter IX 42 United States Code (U.S.C.) Sections 6901–6992
    a. Regulation of USTs
5. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks 40 CFR Part 280, 40 CFR Part 281

a. The Federal regulations concerning USTs

5.0 RESPONSIBILITIES

5.1 Air Programs Manager

The Air Programs Manager is responsible for GRC compliance with the Title V Permit, and ensures all sources of air emissions are documented and permitted as required.

5.2 All GRC Personnel

Any person who discovers a fuel spill at GRC shall immediately notify Emergency Dispatch on a GRC inhouse line (911). If using a cellular phone, dial 216-433-8888 at Lewis Field and 419-621-3222 at Plum Brook Station.

5.3 Authority Having Jurisdiction

The authority having jurisdiction (AHJ) is responsible for providing review and approval on changes made to facilities and systems that affect fire protection and life safety, including model building and fire code (International Code Council) and local (Ohio Fire Code) requirements. The AHJ has the authority to enforce the fire code where these requirements originate.

5.4 Human Capital Development Branch Chief

The Human Capital Development Branch Chief is responsible for the maintenance of training records of GRC personnel for SATERN-based training sessions.

5.5 Chemical Management Lead

The Chemical Management Lead ensures that the requirements of 29 CFR 1910.1200, the Hazard Communication Standard, and the policies and procedures of GRC are met with regards to the bulk storage of oil of any kind or in any form at either Lewis Field or Plum Brook Station.

5.6 Civil Systems Manager

The Civil Systems Manager designs underground storage facilities at GRC.

5.7 Fleet Manager

The Fleet Manager records, monitors, and reports on annual fleet fuel consumption totals for Lewis Field and Plum Brook Station.

5.8 Fuel Distribution Supervisor (Lewis Field) and the Designated Support Service Contractor (Plum Brook Station)

The Fuels Distribution Supervisor verifies that employees who are involved in the transfer of fuel at GRC comply with Glenn Work Instruction number, GLWI–CO–6000.001, Revision E. The supervisor also maintains the daily records of fuel usage, delivery, and consumption at Lewis Field and Plum Brook Station. Also, the supervisor conducts the ordering and delivery of fuels to all UST systems at GRC, except for those located at Buildings 12 and 500 at Lewis Field.

5.9 UST Fuel User

At Lewis Field and Plum Brook Station, the fuel user is responsible in understanding and following all warning and safety precautions when refueling Government or contractor fleet vehicles and equipment. Fuel users are required to report spills to their respective Center dispatch. If spill absorbents are used, they should be collected and disposed of to the proper container or given to personnel in Waste Management for proper disposal.

5.10 UST Program Leads

At either Lewis Field or Plum Brook Station, the UST Program Lead is responsible for administering and enforcing all applicable regulations. The SHeD Facilities Team manages the UST Program at Lewis Field. The SHeD Plum Brook Station team manages the UST Program at Plum Brook Station with assistance from the SHeD Facilities Team.

5.11 UST Operators

The UST Operator is responsible for ensuring UST personnel have completed the annual SATERN Training, inspecting the UST System before, during, and after fuel use, and providing the funding support in the completion of annual inspections, repairs, modifications, spill kit replenishment, and costs of associated permits. See Appendix **B** for listing of these operators.

5.12 Waste Management Program Lead (Lewis Field) and the Designated Support Service Contractor (Plum Brook Station)

The Waste Management Program Lead coordinates the remediation or removal and disposal of contaminated water or soil related to USTs.

6.0 REQUIREMENTS

The following requirements apply to both Lewis Field and Plum Brook Station, unless otherwise noted.

6.1 Annual Registration *(1301:7–9–04)*

Annual registration is due no later than the first day of July of each subsequent year for each facility containing a UST system. The Fire Marshal prescribes the annual registration application at least 30 days prior to the registration deadline of each year by electronic notification. SHeD will complete the annual registration and update onsite certificates.

6.2 Annual Training *(40 CFR 112)*

All personnel who utilize, delivery, and store petroleum-based products are required to complete the following SATERN courses annually:

- Course number GRC–006–08 for Spill Prevention Control and Countermeasures

Highly recommended courses include

- Course number GRC–008–08 for Underground Storage Tanks
- Course number GRC–007–08 for Storm Water Pollution Prevention

By request, all three training sessions may be provided in class for those personnel without computer access.

6.3 Certified UST Inspections *(1301:7–9–11)*

All UST Systems including those not regulated by BUSTR, are required to be inspected annually by a third-party certified inspector. The state Fire Marshal's office is scheduled to complete inspections every 3 years. SHeD is the point of contact for the Fire Marshal. UST tank operators (see Appendix **B**) and their respective organizations are responsible for funding these inspections and subsequent repairs and/or upgrades warranted from those inspections.

6.4 Permits (*OAC 3745.77, 1301:7–9–10*)

Major repairs, modifications, or a change in service of a UST requires application of a permit through the AHJ prior to performing work. All permitted work shall be overseen by a certified UST installer and a certified UST inspector.

Changes in use or fuel type, including usage records of current systems, shall be coordinated with the Air Programs Manager. SHeD will assist in obtaining these permits.

6.5 Recordkeeping *(1301:7–9)*

All records associated to repairs, upgrades, modifications, permits, inspections, and installation shall be retained for the operational life of the UST system. Compliance and performance requirements are documented using the Fire Marshal's prescribed form. SHeD will maintain these records.

6.6 Reporting Requirements *(1301:7–9–03, 40 CFR 112)*

Any Veeder Root alarm either from a sensor in any containment system, the level probe readings, and/or interstice shall be evaluated within 24 hr by SHeD to confirm proper operation or to confirm the presence of a release. Onsite personnel shall notify the respective UST point-of-contact or program lead for Lewis Field and Plum Brook Station in case of an alarm. Releases of 25 gallons or more, or releases that escape the containment system and/or enter the

environment are reported by SHeD to the required agencies (i.e., BUSTR, Brook Park Fire Department, and Ohio Environmental Protection Agency).

6.7 Superfund Amendments and Reauthorization Act (SARA) Reporting

The SHeD Operations Team annually requests hazardous material information from the UST program lead for the Emergency Planning and Community Right-to-Know Act (EPCRA).

6.8 UST Operators and Fuel Delivery *(1301:7–9–08)*

UST operators and fuel delivery personnel are required to do the following:

- Ensure sufficient spill kit supplies are available prior to initiating fuel deliveries. See Appendix **C** for the recommended contents for the spill kits located at the UST sites
- Establish a site designee to be onsite in vicinity of overfill alarms and tank connections during all fuel deliveries into a UST
- Visually inspect spill containment equipment after each delivery and promptly have any water, regulated substance, or debris removed and properly disposed
- Report spills or releases by dialing 911 on an internal NASA phone or 216–433–8888 at Lewis Field or 419–621–3222 at Plum Brook Station on a personal cell phone
- Immediately cease refueling of a tank in the event the overfill protection alarm is triggered
- Contact the SHeD UST point-of-contact immediately when the Veeder Root Monitoring Station signals an Alarm or Warning alert
- Notify SHeD of a change in service or change in fuel type to be stored in the UST

6.9 UST System Testing and Release Detection *(1301:7–9–08)*

All UST systems including interstitial sensors, sump sensors, level probes, and exterior alarms shall be annually evaluated and tested by certified personnel. Tank testing shall be completed per Federal regulations and after all major repairs, upgrades, and modifications. Pipe testing shall have applicable testing completed per the type and location of the piping.

6.10 UST Alarms

In the event of an alarm from the Veeder Root monitoring system for UST's, tank owners/operators will first need to call 911 from a station phone or 216-433-8888 from a cell phone. Tank owners/operators will also need to call Service Station Equipment Company to report the alarm, 216-431-6100.

7.0 RECORDS

- Annual UST Registration.—Completed and filed by the UST Lead on an annual basis per BUSTR requirements.
- Closure reports for removed or abandoned USTs.—Retained by the UST Lead for 3 years after receiving a No Further Action (NFA) letter.
- Records of repairs, modifications, inspections, and tank testing.—Retained by the UST Lead for the life of the tank.
- Records of fuel usage, deliveries, and fuel consumption at GRC.—Retained by the Logistics and Technical Information Division (LTID) and Fleet Manager.
- Records of routine maintenance checkups and repairs.—Retained by the respective support service contractor for Lewis Field and Plum Brook Station.
- Tank Permits for removal, repair, modifications, closure, and/or new installation.—Retained by the UST Lead for the life of the tank or 3 years from receiving an NFA letter from BUSTR.

- UST Training Attendance Sheets and Records.—In-class trainings will be retained by the UST Lead. SATERN trainings will be retained by the Human Capital Development Branch.
- Veeder Root 30-Day Interstitial Monitoring Printouts.—Retained at Plum Brook Station and the UST Lead at Lewis Field for the life of the tank.

8.0 REFERENCES

Document Number	Document Name
40 CFR Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
ANSI B31.3–2002	American National Standard Institute (ANSI) Standard Code for Pressure Piping
American Petroleum Institute (API) 1604–1996 Closure of Underground Petroleum Storage Tanks	
API 1615–2001	Installation of Underground Petroleum Storage Tanks
API 1626–2000	Standard for storing and handling ethanol and gasoline-ethanol blends at distribution terminals and service stations
API 1627–2000	Standard for the storage and handling of gasoline-methanol blends at distribution terminals and service stations
OAC 1301:7	Ohio Administrative Code (OAC), Division of State Fire Marshal
OAC 3745.77	NASA Glenn Research Center Title V Permit information
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 407	Industry standard for aircraft fuel, refueling, and servicing
Underwriters Laboratory (UL 971)	Nonmetallic Underground Piping for Flammable Liquids
UL 1316	Standard for Glass-Reinforced Plastic Underground Storage Tanks for Petroleum Products

APPENDIX A.—DEFINITIONS AND ACRONYMS

Ancillary equipment.—Any device including, without limitation, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an underground storage tank.

American National Standard Institute (ANSI)

American Petroleum Institute (API)

Authority having jurisdiction (AHJ)

Bureau of Underground Storage Tank Regulations (BUSTR)

Certified Installer.—Individual certified by the Fire Marshal under the requirements of rule 1301:7–9–11 of the Ohio Administrative Code to supervise the installation of, performance of major repairs onsite to, closure-in-place of, removal of, performance of, modifications of, placing out-of-service for more than 90 days of, change in service of, or the performance of evaluations of leak detection equipment on underground storage tank systems.

Certified Underground Storage Tank Inspector.—Individual certified by the Fire Marshal under the requirements of rule 1301:7–9–11 of the Ohio Administrative Code to inspect the installation of, performance of major repairs onsite to, closure-in-place of, removal of, performance of, modifications of, placing out-of-service for more than 90 days of, change in service of, or the performance of evaluations of leak detection equipment on underground storage tank systems.

Code of Federal Regulations (CFR)

Corrective action.—Any action necessary to protect human health and the environment in the event of a release of petroleum into the environment, including without limitation, any action necessary to monitor, assess, and evaluate the release.

Emergency Planning and Community Right-to-Know Act (EPCRA)

Fuel user.—Those personnel at either Lewis Field or PBS who refuel Government- or contractor-owned fleet vehicles and equipment with fuel from underground storage tanks. It also includes those personnel whose testing rigs are tied into utilizing fuels from underground storage tanks.

Glenn Research Center (GRC)

Glenn Work Instruction (GLWI)

Heating fuel.—Petroleum that is Numbers 1, 2, 4-Light, 4-Heavy, 5-Light, 5-Heavy, and 6 technical grades of fuel oil. Typically used in the operation of heating equipment, boilers, or furnaces.

Logistics and Technical Information Division (LTID)

Maintenance.—The normal operational upkeep to prevent an underground storage tank system from releasing product.

Major repair.—The restoration, upgrading, or modification of a tank or an underground storage tank system component that has caused a release of a product from the underground storage tank system. It does not include routine maintenance or normal operational upkeep to prevent an underground storage tank system from releasing a product.

Modification.—Work performed on an underground storage tank system component that has not leaked such as adding, altering, or retrofitting the following:

a. Underground storage tanks and any components fixed to underground storage tank openings

b. Containments located over underground storage tanks, under dispensers, or at intermediate points excluding spill prevention equipment

c. Piping components that routinely contain regulated substances up to and including shear valves at the dispenser

d. Underground vent lines excluding stage 3 vapor recovery components

e. Flexible connecter lines

f. Underground storage tank lining components

g. Release detection equipment

Motor fuel.—Petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, numbers 1 or 2 diesel fuel, or any grade of gasoline, and is typically used in the operation of a motor engine.

National Fire Protection Association (NFPA)

No Further Action (NFA).—Official regulatory affirmation that a site adequately protects human health and the environment for the intended use of the site. The letter received often notes the end of corrective actions and may document any property restrictions.

Occupational Health and Safety Administration (OSHA)

Ohio Administrative Code (OAC).—Compilation of general and permanent state regulations that have the force of the law. Administrative codes present a collated version of the regulation, incorporating all additions and deletions.

Operational Life.—The period beginning when installation of the underground storage tank system has commenced until the time the underground storage tank is properly closed under 1301:7–9–02 of the Administrative Code.

Petroleum.—Includes crude oil or any fraction thereof that is a liquid at the temperature of 60 °F and the pressure of $14\frac{7}{10}$ pounds per square inch absolute. It includes, without limitation, motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Regulated substance.—Any hazardous substance and/or petroleum product.

Release.—Any spilling, leaking, emitting, discharging, escaping, leaching, or disposing of a petroleum product from an underground storage tank system into ground water, a surface water body, and subsurface soils or otherwise into the environment.

Repair.—Action to restore a tank or underground storage tank system component that has caused a release of product from the underground storage tank system.

Resource Conservation and Recovery Act (RCRA)

Routine maintenance or normal operational upkeep.—Work performed to maintain or to prevent an underground storage tank system from releasing a regulated substance. Work on the following components shall constitute routine maintenance or normal operational upkeep on existing UST systems provided the component has not caused a leak:

a. Drop tubes

b. Overfill containment devices

c. Spill prevention equipment

d. Fill caps and adapters

e. Cathodic protection components

f. Stage 1 vapor recovery components

g. Submersible pump components provided that no product lines are disconnected

h. Individual leak detection monitoring units, probes, sensors, or line leak detectors that are maintained with like components

Safety, Health and Environmental Division (SHeD)

Spill.—A release resulting from improper dispensing practices to an underground storage tank system including, without limitation, the disconnecting of a delivery hose from a tank's fill pipe before the hose has drained completely.

Spill prevention equipment.—Spill containment manhole or spill bucket installed at a fill pipe that catches and holds drips and spills of regulated substances that can occur when a delivery hose is removed from the fill pipe after delivery of a regulated substance to an underground storage tank.

Superfund Amendments and Reauthorization Act (SARA)

System for Administration, Training, and Educational Resources at NASA (SATERN)

Underwriters Laboratory (UL)

Upgrade.—The addition or retrofit of a system such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank to prevent the release of product.

Underground storage tank (UST).**—**One or any combination of tanks, including the underground piping connected thereto, that are used to contain an accumulation of regulated substances the volume of which, including the volume of the underground pipes connected thereto, is 10 percent or more beneath the surface of the ground. The term does not include any of the following:

a. Tanks used for storing heating fuel for consumptive use on the premise where stored

b. Surface impoundments, pits, ponds, or lagoons

c. Storm or waste water collection systems

d. Flow-through process tanks

e. Storage tanks located in underground areas, including without limitation, basements, cellars, mine workings, drifts, shafts, or tunnels, when the tanks are located on or above the surface of the floor

f. Septic tanks

g. Liquid traps or associated gathering lines directly related to oil or gas production and gathering questions

Underground storage tank operator.**—**The person or organization who requests fuel to be delivered to an underground petroleum storage tank for either Center-wide or individual organizational use.

Underground storage tank system.—Underground storage tanks and the connected underground piping, underground ancillary equipment, and containment system, if any.

United States Code (U.S.C.)

Veeder Root Alarm.—Light and horn alarms triggered at an underground storage tank site when a potential overfill of the tank is about to or has occurred. These alarms are also triggered when leak sensors in sumps or the double wall of the tank detect the presence of water or fuel. All alarms are monitored by the Veeder Root Monitoring Station located at each underground storage tank site and remotely in Building 6.

APPENDIX B.—TANK TABLES

TABLE B.1.—LEWIS FIELD UNDERGROUND STORAGE TANKS

Tank no.	Tank location	Capacity, gal	Fuel type	BUSTR facility ID	Operator contact	Org. Code
101	Bldg. 125	20,000	Jet fuel	18002650	Dennis Dicki	FTO
102	Bldg. 125	20,000	Jet fuel	18002650	Dennis Dicki	FTO
103	Bldg. 102, Site 17	20,000	Jet fuel	18002694	Gwynn Severt	FTA
104	Bldg. 102, Site 17	20,000	Jet fuel	18002694	Gwynn Severt	FTA
105	Bldg. 102, Site 17	10,000[a]	Jet fuel	18002694	Gwynn Severt	FTA
106	Bldg. 102, Site 17	10,000[a]	Empty	18002694	Gwynn Severt	FTA
107	Bldg. 24 North	4,000	Jet fuel	18007803	Dennis Fox	RXD
108	Bldg. 24 South	6,000	Jet fuel	18007803	Dennis Fox	RXD
109	Bldg. 104	10,000	E–85 Ethanol	18002632	Sue Kraus	CO
110	Bldg. 104	10,000	Unleaded gasoline	18002632	Sue Kraus	CO
111	Bldg. 104	6,000	B–20 biodiesel	18002632	Sue Kraus	CO
112	Bldg. 131	25,000	Jet fuel	18002636	Robert Schutte	FA
113	Bldg. 114	1,000	Diesel	18002667	Jim Roeder	FTD
115	Bldg. 500	10,000	No. 2 heating oil	Not required	Dale Wiersma	FDO
116	Bldg. 12	10,000[b]	No. 2 heating oil	Not required	Dale Wiersma	FDO
117	Bldg. 12	10,000[b]	No. 2 heating oil	Not required	Dale Wiersma	FDO

[a]Tank is part of a single tank that has been baffled.

[b]Tanks are part of a single tank with separate compartments piped together to allow transfer of fuel to each other.

[c]Tanks used for storing heating fuel used on the premises are exempt to BUSTR Registration.

TABLE B.2.—PLUM BROOK STATION UNDERGROUND STORAGE TANKS

Tank no.	Tank location	Capacity, gal	Fuel type	BUSTR facility ID	Operator contact	Org. Code
201	Bldg. 7132	8,000	Unleaded gasoline	22007804	Tom Keating	H - FDO
202	Bldg. 7132	8,000	Diesel	22007804	Tom Keating	H - FDO

APPENDIX C.—SPILL KIT SUPPLIES

TABLE C.1.—RECOMMENDED SUPPLIES FOR SPILL KITS[a]

Type of Spill Supply	Amount	Comments
Bundle of universal spill pads	100	For all types of liquids
Bundle of oil-only pads	100	These pads attract oils and fuels only
3-ft Universal Socks	6	For all types of liquids
10-ft Universal Socks	3	For all types of liquids
Spill stopper drain cover	1	Replacements should cover the largest drain of concern

[a]Spill kit type is a large, rectangular four-wheeled container.

Additional supplies acceptable for a specific site may include the following:

- Drip pans for aboveground piping leaks
- Drain plugs for smaller drains and temporary sealing of drains
- Spill-absorbent pillows
- Loose absorbent such as clay or ash
- Clear bags for absorbent collection and disposal